

## § 160.077-13

strength and tear strength determined from testing prescribed in §160.077-19(d). No individual sample result for breaking strength or tear strength may be more than 20% below the results obtained in approval testing.

(2) *Fabric covered chambers.* Each material used in the construction of inflation chambers that are covered with fabric must meet the requirements specified for—

(i) Bladder materials in section 3.2.6 of MIL-L-24611(SH) if the material is an unsupported film, except that any color or finish may be used; or

(ii) Coated fabric in section 3.1.1 of TSO-C13 if the material is a coated fabric.

(3) *Uncovered chambers.* Each material used in the construction of inflation chambers that are not covered with fabric must meet the requirements specified in paragraph (d)(2)(ii) and (a)(5)(i) of this section.

(e) *Thread.* Each thread must meet the requirements of subpart 164.023 of this chapter. Only one kind of thread may be used in each seam. Thread and fabric combinations must have similar elongation and durability characteristics.

(f) *Webbing.* Webbing used as a body strap, tie tape or drawstring, or reinforcing tape must meet §160.002-3(e), §160.002-3(f), and §160.002-3(h) of this chapter respectively. Webbing used for tie tape or drawstring must be capable of easily holding a knot and being easily tied and untied. Webbing used as reinforcing tape must be smooth enough to prevent chafing the wearer.

(g) *Closures—(1) Strength.* Each closure such as a buckle, snap hook and dee ring, or other type of fastening must comply with UL 1517, section 4.1. The width of each closure opening through which body strap webbing passes must be the same as the width of that webbing.

(2) *Means of Locking.* Each closure used to secure a PFD to the body, except a zipper, must have a quick and positive means of locking, such as a snap hook and dee ring.

(3) *Zipper.* If a zipper is used to secure a PFD to the wearer it must be—

- (i) Easily initiated;
- (ii) Non-jamming;
- (iii) Right handed; and

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(iv) Of a locking type.

(h) *Inflation medium.* If a hybrid PFD has an automatic or manual inflation mechanism—

(1) The inflation medium must not contain or produce compounds more toxic than CO<sub>2</sub> in sufficient quantity to cause an adverse reaction if inhaled through any of its oral inflation mechanisms; and

(2) Any chemical reaction during inflation must not leave a toxic residue.

(i) [Reserved]

(j) *Kapok pad covering.* If kapok flotation material is used, pad covering that meets §160.047-3(e) of this chapter must be provided to enclose the material in at least three separate pads.

[CGD 78-174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 84-068, 58 FR 29494, May 20, 1993; CGD 78-174, 60 FR 2486, Jan. 9, 1995; USCG-2000-7790, 65 FR 58463, Sept. 29, 2000]

## § 160.077-13 Materials—Type I and Commercial Hybrid PFD.

(a) *General.* All commercial hybrid PFD materials must meet §160.077-11 and this section.

(b) *Closures.* Each closure other than a zipper must have a minimum breaking strength of 1000 N (225 lbs). If a zipper is used to secure the PFD to the body, it must be used in combination with another closure that has a quick and positive means of locking.

(c) *Retroreflective Material.* Each PFD must have at least 200 sq. cm. (31 sq. in.) of retroreflective material on its front side, at least 200 sq. cm. on its back side and at least 200 sq. cm. of material on each reversible side, if any. The material must be Type I material that is approved under Subpart 164.018 of this chapter. The material attached on each side must be divided equally between the upper quadrants of the side. The material, as attached, must not impair PFD performance.

[CGD 78-174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 78-174, 60 FR 2487, Jan. 9, 1995]

## § 160.077-15 Construction and Performance—Recreational Hybrid PFD.

(a) *Performance.* (1) Each recreational hybrid PFD must be able to pass the tests in §160.077-19.

(2) Each recreational hybrid PFD must—

(i) If second stage donning is required, have an obvious method for doing it;

(ii) If it is to be marked as Type II or Type V providing Type I or II performance, not require second stage donning to achieve that performance;

(iii) Be capable of being worn while inflated at 60 N (13 lb.) of buoyancy without significantly changing its appearance from, or making it significantly less comfortable than, the uninflated condition;

(iv) Not cause significant discomfort to the wearer during and after inflation; and

(v) If it has a manual or automatic inflation mechanism and can be put on inside out, not restrict breathing when donned inside out, adjusted to fit, and inflated.

(b) *Construction; General.* Each recreational hybrid PFD must—

(1) Have one or more inflation chambers;

(2) Have at least one oral means of inflation on each inflation chamber;

(3) Have at least one automatic inflation mechanism that inflates at least one chamber, if marked as providing Type I or II performance;

(4) Be constructed so that the intended method of donning is obvious to an untrained wearer;

(5) Not have a channel that can direct water to the wearer's face to any greater extent than that of the reference vest defined in §160.077-3(j).

(6) Have a retainer for each adjustable closure to prevent any part of the closure from being easily removed from the PFD;

(7) If marked as universally sized for wearers weighing over 40 kg (90 pounds), have a chest size range of at least 76 to 120 cm (30 to 52 in.);

(8) Not have means of access to any inherently buoyant inserts;

(9) Not have edges, projections, or corners, either external or internal, that are sufficiently sharp to damage the PFD or cause injury to anyone using or maintaining the PFD;

(10) Be of first quality workmanship;

(11) Unless otherwise allowed by the approval certificate—

(i) Not incorporate means obviously intended for attaching the PFD to the vessel; and

(ii) Not have any instructions indicating that attachment is intended;

(12) Except as otherwise required by this section, meet UL Standard 1517, sections 6.14, 6.20, 7.1, 7.3, 7.8, 8.4, and 9; and

(13) Provide the minimum buoyancies specified in Table 160.077-15(b)(13).

TABLE 160.077-15(b)(13)—BUOYANCY FOR RECREATIONAL HYBRID PFDs

	Adult	Youth	Small child
Inherent buoyancy (deflated condition):			
Type II .....	45 N (10 lb) .....	40 N (9 lb) .....	30 N (7 lb)
Type III .....	45 N (10 lb) .....	40 N (9 lb) .....	N/A
Type V .....	33 N (7.5 lb) .....	34 N (7.5 lb) .....	N/A
Total buoyancy (inflated condition):			
Type II .....	100 N (22 lb) .....	67 N (15 lb) .....	53 N (12 lb)
Type III .....	100 N (22 lb) .....	67 N (15 lb) .....	N/A
Type V .....	100 N (22 lb) .....	67 N (15 lb) .....	N/A

(14) Meet any additional requirements that the Commandant may prescribe, if necessary, to approve unique or novel designs.

(c) *Inflation mechanism.* (1) Each inflation mechanism on a recreational hybrid PFD must—

(i) Not require tools to activate it or replace its inflation medium cartridge or water sensitive element;

(ii) Have an intended method of operation that is obvious to an untrained wearer; and

(iii) Be located outside of its inflation chamber.

(2) Each oral inflation mechanism must—

(i) Be designed to operate without pulling on the mechanism;

(ii) Not be capable of locking in the open or closed position except that, a

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friction-fit dust cap that only locks in the closed position may be used; and

(iii) Have a non-toxic mouthpiece.

(3) Each automatic and manual inflation mechanism must—

(i) Have a simple method for replacing the inflation medium cartridge; and

(ii) Be in a ready-to-use condition or be conspicuously marked to indicate that the inflation mechanism is not in a ready-to-use condition and that the purchaser must assemble it.

(4) Each manual inflation mechanism must—

(i) Provide an easy means of inflation that requires only one deliberate action on the part of the wearer to actuate it; and

(ii) Be operated by pulling on an inflation handle that is marked “Jerk to Inflate” at two visible locations.

(5) Each automatic inflation mechanism must—

(i) Have an obvious method for indicating whether the mechanism has been activated; and

(ii) Be incapable of assembly without its water sensitive element.

(6) The marking required for the inflation handle of a manual inflation mechanism must be waterproof, permanent, and readable from a distance of 2.5 m (8 ft.).

(d) *Deflation mechanism.* (1) Each inflation chamber must have its own deflation mechanism.

(2) Each deflation mechanism must—

(i) Be readily accessible to either hand when the PFD is worn while inflated;

(ii) Not require tools to operate it;

(iii) Have an intended method of operation that is obvious to an untrained wearer, and

(iv) Not be able to be locked in the open or closed position.

(3) The deflation mechanism may be the oral inflation mechanism.

(e) *Sewn seams.* Stitching used in each structural seam of a PFD must provide performance equal to or better than a Class 300 Lockstitch meeting Federal Standard No. 751.

[CGD 78-174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 78-174A, 51 FR 4351, Feb. 4, 1986; CGD 78-174, 60 FR 2487, Jan. 9, 1995]

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### § 160.077-17 Construction and Performance—Type I and Commercial Hybrid PFD.

(a) *General.* Each commercial hybrid PFD must meet—

(1) Paragraph (b) of this section; and

(2) Section 160.077-15, except § 160.077-15(a)(2)(iii) and § 160.077-15(c)(1)(i).

(b) *Additional requirements.* Each commercial hybrid PFD must—

(1) Be able to pass the tests in § 160.077-21;

(2) Not present a snag hazard when properly worn;

(3) When worn inflated, have a visible external surface area of at least 1300 sq. cm (200 sq. in.) in front and 450 sq. cm (70 sq. in.) in back that are primarily vivid reddish orange as defined by sections 13 and 14 of the “Color Names Dictionary”;

(4) Have at least one inflation chamber, except that a hybrid PFD approved as a SOLAS lifejacket must have at least two inflation chambers;

(5) Have at least one manual inflation mechanism.

(6) Have at least one automatic inflation mechanism that inflates at least one chamber; and

(7) Not require second stage donning after inflation.

(8) If approved for adults, be universally sized as specified in § 160.077-15(b)(7).

(9) Commercial hybrid PFDs employing closures with less than 1600 N (360 lb) strength, must have at least two closures that meet UL 1517, Section 22.1.

(10) Each commercial hybrid PFD must have an attachment for a PFD light securely fastened to the front shoulder area. The location should be such that if the light is attached it will not damage or impair the performance of the PFD.

(11) In the deflated and the inflated condition, provide buoyancies of at least the values in Table 160.077-17(b)(11).